

opinion, he was the bravest German airman whom it has been my privilege to see fight." Rhys-Davids exclaimed: "Oh! If I could have brought him down alive!" Voss had won the *Pour le Mérite* (the German equivalent of the V.C.), and had brought down forty-nine Allied aircraft. His death undoubtedly saved the lives of many other British airmen.

### The Phoenix

In October, 1917, Major Blomfield was replaced as C.O. by Major R. Balcombe-Brown. The latter was killed in air combat on May 2, 1918. He had gone out alone, and was last seen fighting over Martinpuich in the Somme area. He was succeeded by Major E. J. L. W. Gilchrist. Grinnell-Milne says of him: "He was tall, lean, young; his small moustache seemed almost black by contrast with his exceedingly pale face. He wore the uniform of the 9th Lancers, Wings, and a Military Cross ribbon." His health was strained to the breaking point after a bad crash and then hard work as a squadron commander. Consequently he knew when it was wise to keep an over-wrought pilot on the ground for a while. Once on returning from an aerodrome raid which he had led, he landed, taxied up to the sheds, and then fainted in his seat from sheer strain on the system. He kept going until after the Armistice, but then had to be sent to hospital. Grinnell-Milne took over the command until the squadron was reduced to cadre. The remnants were disbanded at Bircham Newton on January 22, 1920.

The Royal Air Force could not endure to lose a squadron like No. 56 for ever. A month after the disbandment at Bircham Newton the squadron was brought to life again by renumbering No. 80 Squadron, which was then in Egypt, flying Camels. The new No. 56 Squadron was again about to be disbanded in September, 1922, when the Chanak crisis arose, and a flight was sent with other R.A.F. units to Constantinople. Then the squadron (less one flight) was re-formed at Hawkinge in November, 1922, equipped with Snipes, and in August, 1923, was rejoined by the flight from Constantinople. By that time the squadron had moved to Biggin Hill, and in September, 1924, it was re-equipped with Grebes. Next year it and No. 25 were the two fighter squadrons chosen to take part in the great Army manoeuvres round Andover. In September, 1927, the Grebes were changed for Siskins, and next month the squadron moved to its present home at North Weald in Essex. In due time the Siskins gave way to Bulldogs, and in the present year the squadron received Gauntlets.

The old spirit of this famous squadron is kept alive, and on all air exercises wherever the red and white chequers are seen on the fuselage of a fighter it is certain that the pilot will show an offensive spirit and will get the best out of his machine. The S.E.5's constantly beat enemies of superior performance. How the modern fighter will fare against the fast modern bomber can perhaps only be proved in war. Everyone hopes that the question will never be put to the proof over the soil of England.

## FROM PETROL to OIL FUEL

### *A Simple Conversion of a Cirrus II Engine : Electrical Ignition Retained*

**I**N view of the renewed attention now being given to the possibilities of the compression-ignition engine for aircraft work, there is considerable interest in a Finnish invention which permits the use of Diesel fuel in a more or less orthodox petrol engine. Compression ignition is not employed; instead, the oil is vaporised to a suitable degree and then fired by sparking plug in the normal manner.

The operation of the device was demonstrated at Heston last week on a Cirrus II engine, the conversion of which has quite simply been carried out. A ring of special iron alloy, half an inch thick, is interposed between each cylinder head and barrel. Inside this ring are six sloping vanes or baffles which catch and vaporise the Diesel oil from a three-nozzle injector, the arrangement being such as to produce efficient turbulence horizontally round the cylinder. The injector is fed by a normal four-cylinder Bosch fuel pump.

The difficulty which confronted the inventor, Mr. E. Pohjanpalo, was to design the vane ring and develop its alloy so that just sufficient heat was retained from each ignition to vaporize the oil without, however, causing actual ignition. Obviously, the problem was complicated by the fact that operational temperatures differ considerably over the range of engine speeds required.

The cylinder heads are also of iron alloy and are slightly modified to allow the injector to be located centrally in each head.

#### Starting

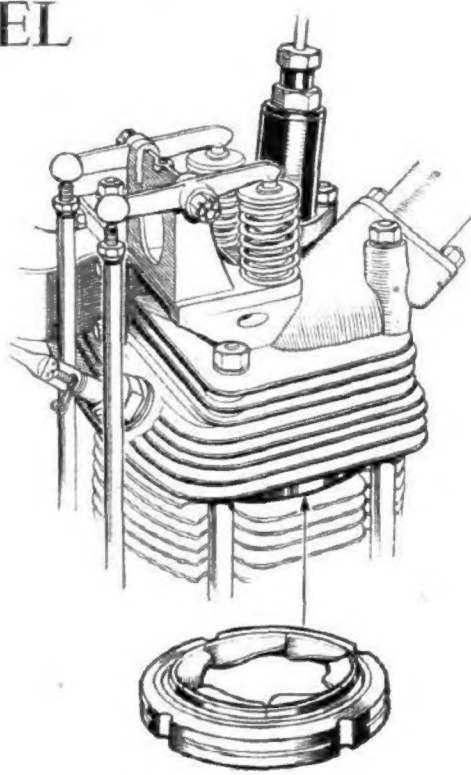
Starting on this engine presents no difficulty. A small hand pump—which may later be incorporated with the starter—delivers a few sprays of petrol from a very small reservoir via the air throttle, and the engine readily starts from cold on petrol. After about 30 seconds' running a change-over to oil fuel is made and a single throttle lever then controls both air and oil.

Unlike that of the compression-ignition engine, the compression ratio is quite low, being 6.5:1, while satisfactory running has been achieved even on a 6:1 ratio. The Cirrus II bore and stroke remain unchanged, namely, 100 x 130 mm., but whereas the original horse-power was 75/80 h.p., the conversion is claimed to give 80 h.p. normal and 95 h.p. maximum. Normal engine speed is 1,800 r.p.m. and maximum 2,000 r.p.m., but even running and acceleration are possible from 400 r.p.m. to the maximum.

The ignition and lubrication system are not changed; two B.T.H. magnetos are mounted facing each other at the rear, on the starboard side, and on the port side the injector pump is located. The total weight of the engine is increased about 12lb. by the conversion.

No installation in an aircraft has yet been made, but engines of a similar type, covered by the same patents, have been in use in the Finnish Navy for small high-speed patrol boats, of which very satisfactory reports are given. Many tanks are also powered with Pohjanpalo-converted Renault engines—in which connection it is interesting to remember the reports of serious fires in petrol-driven Italian tanks during the Abyssinian campaign.

Those wishing to get into touch with the inventor may do so through Commandant M. de Gripenberg, Finnish Legation, 37, Smith Square, London, S.W.1.



One of the heads of the converted engine, showing the injector and the vaporising ring.

#### Personal Kit

**E**NTITLED "Everything for Aviation Wear," a new catalogue has been issued by D. Lewis, Ltd., 124, Great Portland Street, London, W.1. Unusually well illustrated, the catalogue lives up to its title, and a special feature is made of the firm's latest flying suits.